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What To Study In HCI? A Reflection Based On CHI and UK Research Data

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Figure 1: Section of topics funded by the research in the UK.

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Abstract

HCI is a wide, varied, and complex field that covers a broad spectrum of research. We therefore believe that there is no simple answer to the question 'what to study in HCI?' To shed some light on it, however, we reflect on this question with the aid of data from past HCI conferences, present meta-analyses reports, and possible future research priorities. In our discussion, we argue that the current focus of HCI research is too focused on studying the usability of gadgets. Instead, we believe that researchers in the HCI field have the unique opportunity to combine fundamental research, usability design, and awareness of social issues to achieve real-world impact. As such, we suggest that researchers should aim their studies on human aspects that can solve various needs, problems, and societal challenges.

Author Keywords

Research; strategy; overview; research portfolio; CHI; introspection; overview; data; topics; topic map; visualization; area; study; reflection; discussion; HCI.

ACM Classification Keywords

H.5.0. Information interfaces and presentation (e.g., HCI): General.

Fundamental	Usable: No	Usable: Yes
Yes	**Bohr** Pure Basic Research	**Pasteur** use-inspired Research
No	--	**Edison** Pure Applied Research

Figure 2: Pasteur's quadrant signifies research that is fundamental and usable.

Fundamental	Usable: No	Usable: Yes
Yes	Laws, Methods or Design Processes	Human Computer Interaction
No	Courses, Tutorials or Seminars	Demoes, Tools, Gadgets or Technologies

Figure 3: Examples of where HCI can fit in Stokes' quadrants.

Introduction

In this paper we attempt to answer the deceivingly simple question of 'what to study in HCI?' by reflecting on past HCI conferences, meta-analysis reports, and possible future funding priorities. We hope our personal reflection on this question will generate discussion and introspection within the community. In addition, we hope to aid future planning, development, and advancement in this field.

This paper is divided into three topics of discussion:

- First, we discuss the balance of the HCI area in relation to Pasteur's quadrant and the unique opportunity in the HCI field to study subjects that can generate real world *impact*.
- We then discuss current topics in the HCI field and their *inter-disciplinary* nature.
- Our discussion then explores an analysis of the whole UK research portfolio with the objective to explore possible *research funding* priorities.

In our conclusion, we suggest researchers should focus more on social issues, bringing to bear the rich methodologies and technologies already present in the HCI field while maximizing their *impact, inter-disciplinary research*, and *research funding* possibilities.

Real-World Impact

To select what to study in HCI, we first need to understand the different types of research in the field. Stokes [6] differentiates *basic* and *applied* research:

- *Basic research* is primary undertaken to acquire new knowledge of the underlying phenomena and observable facts,
- While *applied* research is defined as the elaboration and application of the known.

The HCI field has a rich history of exploring these two types of research. For example, as we will discuss in the next section there is no shortage of research about fundamental laws and methods, which could be considered *basic research*, or usable demoes and tools, which is *applied research*. While this research is of course valuable, we believe that it can lack real-world impact. This is particularly important as in the current research climate, as most researchers are required to demonstrate various types of *impact* from their work [6].

Stokes labels a third class of research, however, bridging *basic* and *applied research* which he called *Pasteur's quadrant* (see *Figure 2*). Research in this quadrant seeks to utilize both types of research to give benefit to society at large. It is this quadrant, therefore, that we believe HCI should seek to explore in the future as not only will this allow the research to benefit a wider array of people, but it will provide excellent impact for the researchers.

Inter-disciplinary Topics

Our own data-driven study [5] and a co-word analysis study by Liu et al [4] of the most prominent HCI conference series (ACM SIGCHI) demonstrated that the field comprises of a wide variety of topics.

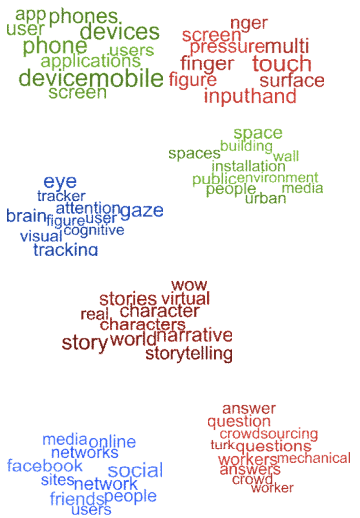

Figure 4: Selection of a few research topics from our data driven analysis.

Mobile phone, Ubicomp, Visualization, Handheld Device, CMC, Gesture, User Studies, Collaboration, Privacy, CSCW, Design, Children, Sustainability, Ethnography, Infoviz, Mobile, TUI, Games, Fitt's Law, Online Communities, HCI4D/ICTD, Interaction Design, Augmented Reality, Participatory Design, Social Networks, Usability, Crowdsourcing

Figure 5: List of the most popular topics from Lui's work.

An inherent benefit of having a wide range of topics is the creation of a rich, inter-disciplinary community as described by the Research Councils UK (RCUK) [6] and the Engineering and Physical Sciences Research Council (EPSRC) [3]. This rich inter-disciplinary community can serve as a prime example of research as described by *Pasteur's quadrant.* It seems, however, that most topics in HCI consist of either *basic* or *applied* research as shown in *Figure 4* and *5*.

As previously discussed, we believe HCI research would benefit from taking inspiration from *Pasteur's quadrant* as it would have a larger benefit to society. To an extent, we also believe research in this quadrant is linked to research of social, or human aspects. However, Lui et al [4] maintains that human aspects did not emerge as discernable topics in their analysis of the HCI community.

We acknowledge that one of the qualities of the HCI community is the continuous exploration of new and novel technologies. Liu at al [4] even compared it to "nomads chasing water and grasslands". However, we believe that researchers in HCI should be more concerned with using technologies to solve social issues.

Research Funding

We applied the same data driven analysis [5] to the whole UK research portfolio to see whether human aspects are prioritized by funding organizations.

We believe research in the UK is a good benchmark to study funding, as it follows the *Haldane Principle* [1] and as such is mostly immune to political agendas. The main idea behind this principle is that researchers and not politicians or lobbying groups should decide on what research funding is prioritized [2].

Our analysis shows that the most funded topics are based on *human aspects*. As shown in *Figure 6*, the funded topics from the different research councils are mostly based on human needs, problems, or challenges. As a result, we presume studying subjects based on human aspects would be perceived as having more real world impact and therefore be more worthy of funding.

Furthermore, we believe our analysis allows researchers to examine the various funded research topics and identify new coveted and overlooked research areas where HCI can be applied for their future studies.

Conclusions

In this, our personal reflection of the HCI field, we believe researchers should concentrate on subject areas that are based primarily in human aspects, ones that solve human issues, problems or challenges.

We also believe that focusing study on fundamental but also usable research will improve possible impact, create sought-after intra-disciplinary research, and improve one's chances of getting research funding as shown in our analysis and discussion.

We hope this paper will help discussion and introspection in the field with the aim to aid future planning, development, and advancement in this field.

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Figure 6. Map showing the topics from funded projects in the UK. (42k Grants, £3b budget)